



the casing 16. The casing 16 has a square base and a cylindrical upper portion. The parabolic curves of Figs. 1 and 3 are the lines of transformation.

5 Above the upper edge 17 of the casing 16 and between it and the back plate 18 of the fan wheel, the delivery edges of the blades extend. The back plate 18 turns the air and delivers it as shown by the arrows indicating air flow, of Fig. 1; through an opening 19 in the housing to be deflected by the annular member 20, from the ventilator. The shield 21 serves to protect the motor 13 from the elements.

15 In the embodiment of the fan wheel illustrated, the hub 22 and blades 11 are cast as an integral unit. The hub 22 tapers from the back plate 18 to its extreme inner portion 23, as illustrated more clearly by Fig. 4. The hub 22 increases rapidly in diameter as it closely approaches the back plate 18 and its curved outer surface at 25 cooperates in turning the air from the wheel in quiet, efficient flow.

Fig. 7 illustrates the development of one of the blades upon the cylindrical surface of a quadrant of a cylinder. The line AB is the line, along which the lower end of the generatrix lines moves while the upper end moves along the curve CD. The successive positions of the generatrix are shown at BC, EF, GH, IJ, KL and MN. The curve followed by the generatrix is so chosen that the generatrix forms the blade as a helix with increasing pitch towards the back plate.

The line CD of Fig. 7 since lying on the surface of a cylinder, is spaced the same distance from the line AB, at all points. The outer curve of the inlet portion of the blade coincides with the curve along the line CH, but departs from it to follow the line HO along the delivery edge, so as to provide a delivery portion having decreasing depth towards the back plate as determined by the formula.

The lower or base portion of the blade is sloped to fit along the hub 22 of the wheel.

The shaded portion of Fig. 7 illustrates the surface of the blade after it has been shaped to provide a delivery portion having decreasing depth towards the back plate, and to fit along the hub of the wheel. Other characteristics of the blade are: It has a constant radial depth in the entry portions CH; it lies along a surface of a helix having increasing pitch towards the back plate; its delivery edge terminates in a plane transverse to the fan wheel; its inlet edge PC (Figs. 2, 4 and 7) lies along a line passing through the axis of the fan wheel, and

its delivery edge (Fig. 2) at the back plate terminates in a plane in which the axis of the wheel lies.

Characteristics of the embodiment of the fan wheel illustrated. The entering edges of opposite blades lie substantially in a plane transverse to the axis of the wheel (Fig. 2). The entering edge of each blade lies in a plane in which the delivery edge of the adjacent blade terminates.

Since all elements of each blade extend in lines radiating from the center line of the shaft, centrifugal forces are a minimum and the fan may be rotated at very high speeds without fear of mechanical failure. The fan is not only very quiet and efficient in operation, but may be easily and economically manufactured.

While one embodiment of the invention has been described for the purpose of illustration, it should be understood that the invention is not to be limited to the exact arrangement described, as many departures may be made by those skilled in the art, after having had access to this disclosure.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A blade for a centrifugal fan having a back plate to which the delivery portion of the blade is attached, characterized by the fact that the inlet portion of the blade has a substantially constant depth throughout while the delivery portion of the blade has a gradually decreasing depth.

2. A blade in accordance with claim 1, characterized by the fact that the blade is curved throughout.

3. A blade in accordance with claim 2, characterized by the fact that all elements of the blade extend in radial lines.

4. A blade in accordance with claim 2, characterized by the fact that the blade is formed as a helix.

5. A blade in accordance with claim 3, characterized by the fact that the blade is formed as a helix.

6. A blade in accordance with claim 4, characterized by the fact that the helix is of increasing pitch towards the back plate.

7. A blade in accordance with claim 5, characterized by the fact that the helix is of increasing pitch towards the back plate.

8. A blade in accordance with claim 1, characterized by the fact that the blade has the surface of a conoid.

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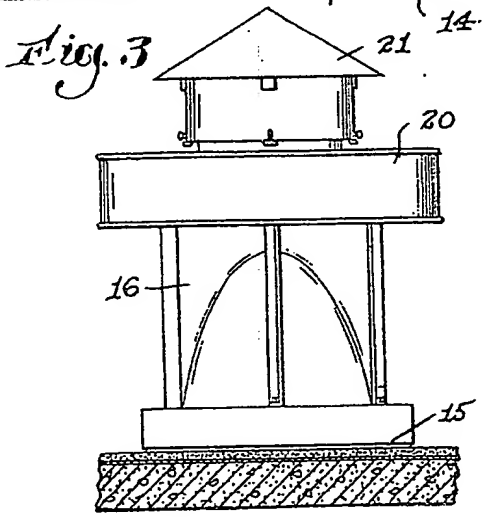
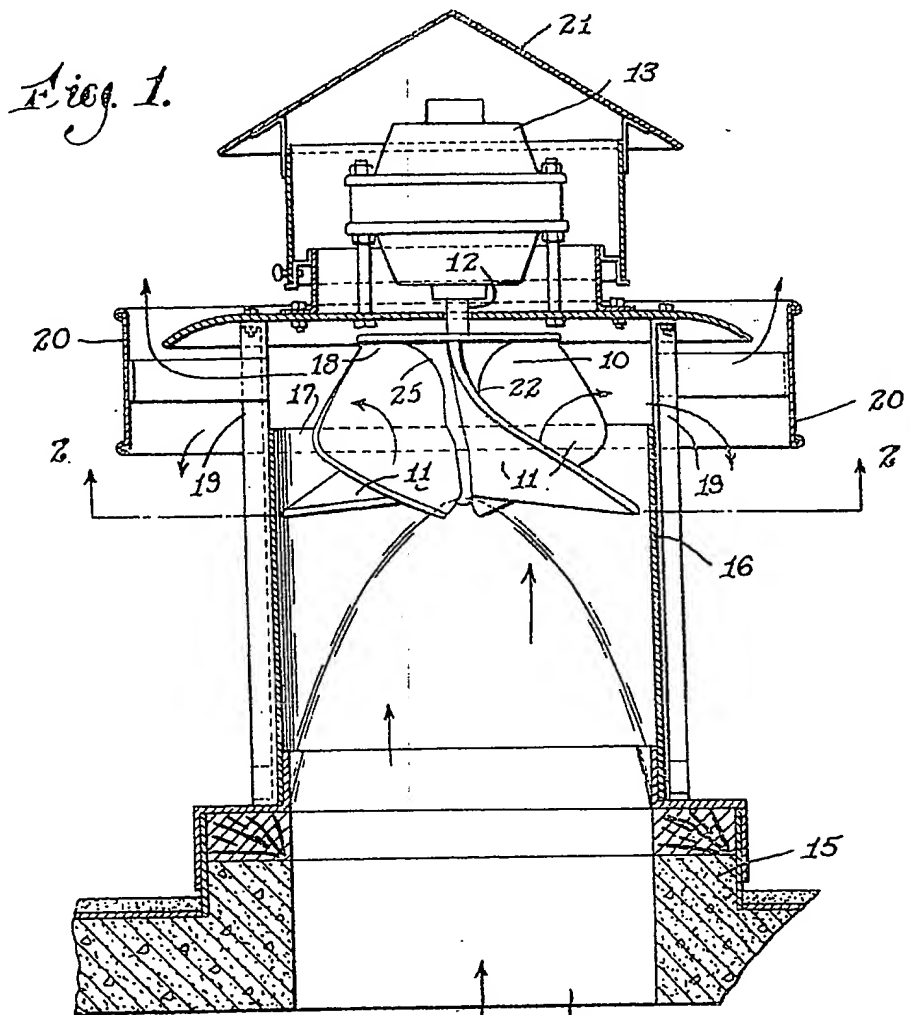
9. A blade in accordance with claim  
8, characterized by the fact that the blade  
has the form of a helix.

10. A blade in accordance with claim  
5 9, characterized by the fact that the helix  
has increasing pitch towards the back  
plate.

Dated this 11th day of May, 1937.

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103, Kingsway, London, W.C.2.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1938.



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 2.

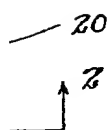
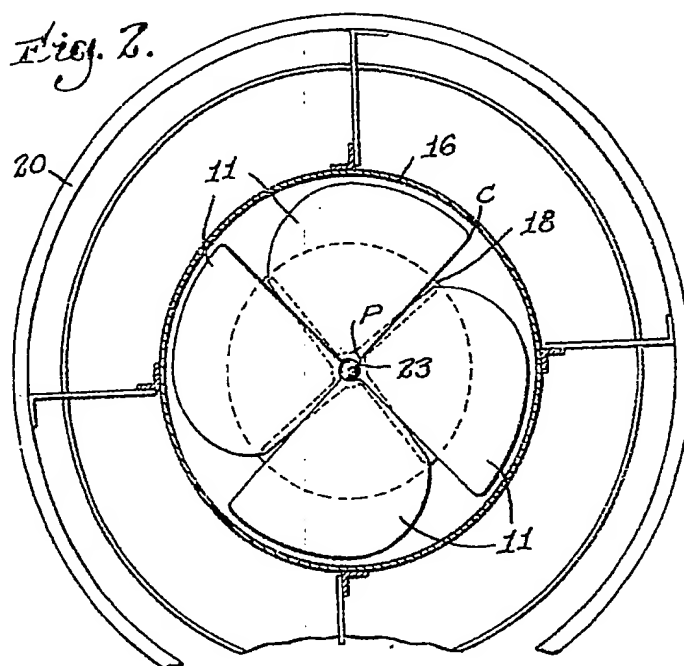
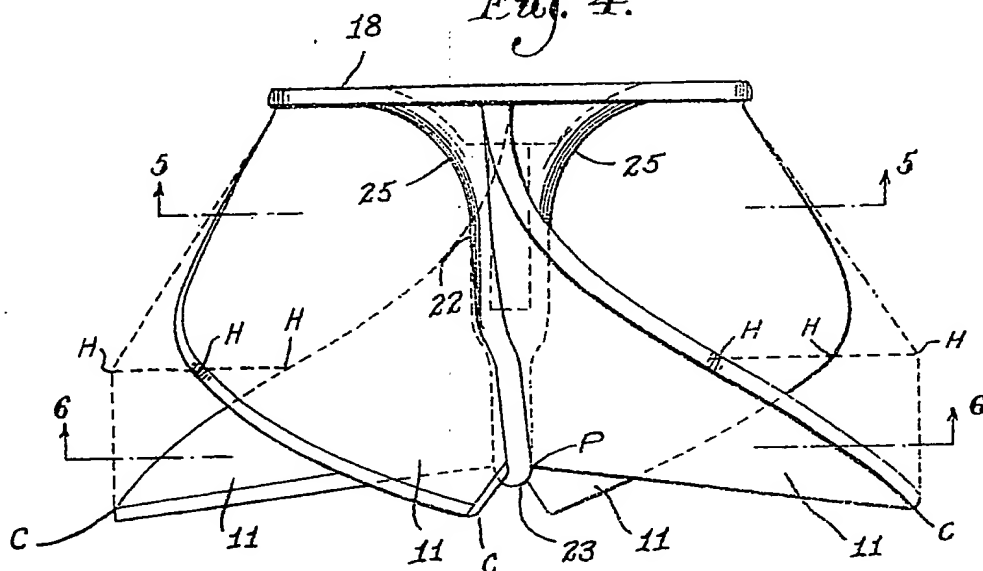
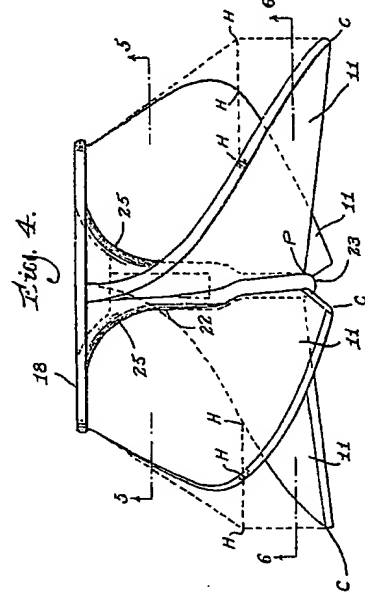
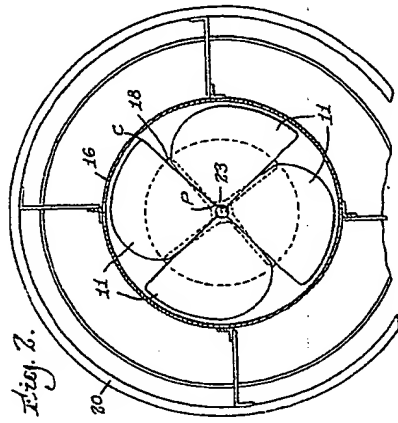
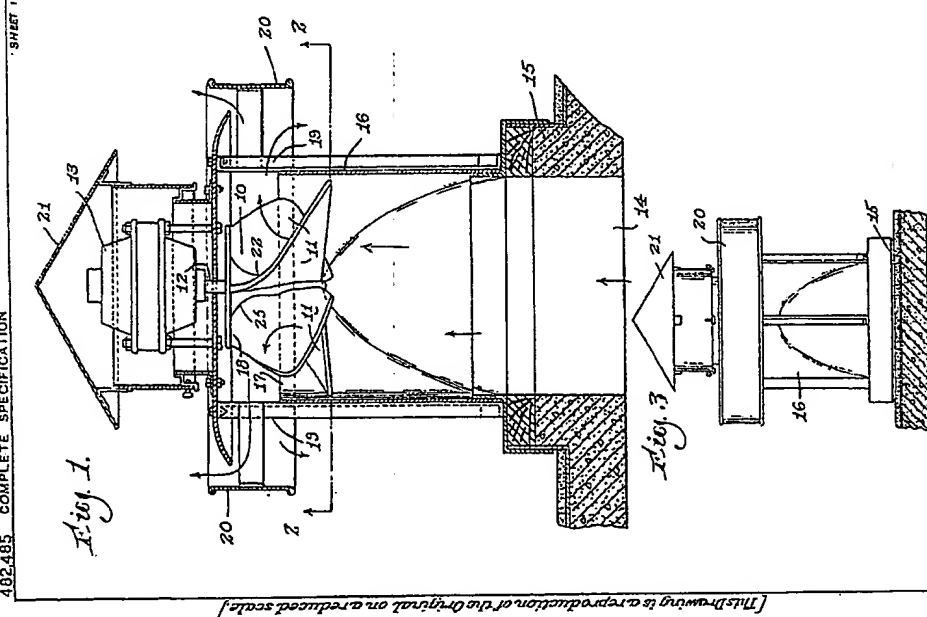


Fig. 4.



3 SHEETS  
SHEET 2

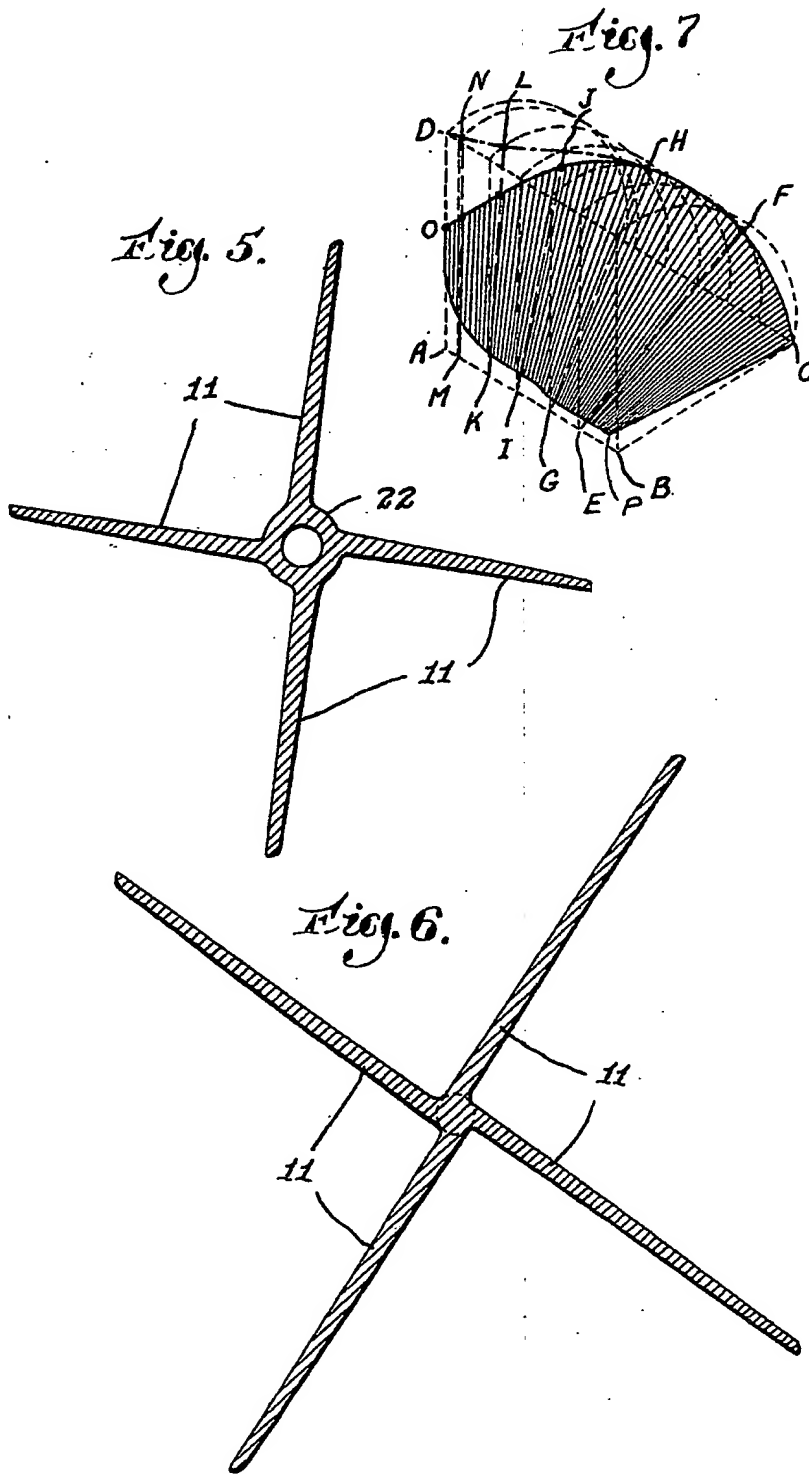
482485 COMPLETE SPECIFICATION



Atty. & Sona, Boston, U.S.A.

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